

AMENDMENTS TO THE CLAIMS

Claims 1-37. (canceled)

38. (currently amended) A wafer production system comprising:

a first machine for processing wafers in a first orientation;

a second machine for processing wafers in a second orientation;

a system arranged to acquire calibration data representative of a difference in alignment between a first pattern formed on a calibration wafer in the first machine and a second pattern formed on the calibration wafer in the second machine; and

a processor arranged to mathematically transform the calibration data to account during wafer alignment for a change in processing orientation of a production wafer transferred between the first machine and the second machine.

39. (currently amended) A wafer production system as recited in claim 38, wherein the system arranged to acquire calibration data includes ~~an~~ a pattern forming arrangement in each of the first and second machines developed to form patterns on the calibration wafer.

40. (previously presented) A wafer production system as recited in claim 39, wherein the arrangement in each of the first and second machines is developed to form printed patterns on an upper surface of the calibration wafer.

41. (previously presented) A wafer production system as recited in claim 39, wherein the processor determines differences between first coordinates of the first pattern formed on the calibration wafer in the first orientation and second coordinates of the second pattern formed on the calibration wafer in the first orientation.

42. (previously presented) A wafer production system as recited in claim 38, wherein the system arranged to acquire calibration data includes metrology in each of the first and second machines equipped to determine locations of points of the first and second patterns formed on the calibration wafer.

43. (previously presented) A wafer production system as recited in claim 38, wherein the first machine is a stepper and the second machine is a scanner.

44. (currently amended) A wafer production system ~~processing apparatus~~ as recited in claim 43, wherein the stepper and the scanner are not equipped to execute stepping and scanning in respectively different directions.

45. (previously presented) A wafer production system as recited in claim 38, further comprising an adjustor equipped to adjust the alignment of a production wafer based on the calibration data.

46. (currently amended) A wafer processing apparatus comprising:

a first machine and a second machine for processing production wafers in respective first and second orientations;

a first device arranged to form a first pattern on a calibration wafer in the first orientation in the first machine;

a second device arranged to form a second pattern on the calibration wafer in the first orientation in the second machine; and

a wafer alignment adjusting ~~an~~ arrangement controlled to adjust an alignment of a production wafer processed in the second orientation in the second machine based on differences between the first pattern and the second pattern.

47. (previously presented) A wafer processing apparatus as recited in claim 46, further comprising a processor arranged to generate a calibration array based on the differences between the first pattern and the second pattern.

48. (currently amended) A wafer processing apparatus as recited in claim 47, wherein the processor is arranged to mathematically transform the calibration array to account during wafer alignment for a rotation of the production wafer for processing in the second machine in the second orientation subsequent to processing in the first machine in the first orientation.

49. (previously presented) A wafer processing apparatus as recited in claim 46, wherein the first orientation and the second orientation are mutually orthogonal.

50. (currently amended) A wafer processing apparatus as recited in claim 46, wherein the patterns are formed on an upper surface of the calibration ~~wafers~~ wafer.

51. (previously presented) A wafer processing apparatus as recited in claim 46, wherein the patterns are formed by printing.

52. (previously presented) A wafer processing apparatus as recited in claim 51, wherein the patterns are cruciform.

53. (previously presented) A wafer processing apparatus as recited in claim 46, wherein the first machine is a stepper, and the second machine is a scanner.

54. (previously presented) A wafer processing apparatus as recited in claim 53, wherein the stepper and the scanner are not equipped to execute stepping and scanning in respectively different directions.

55. (previously presented) A wafer processing system comprising:

a first device controlled to form a first calibration pattern on a calibration wafer in a first orientation, and to process a production wafer in the first orientation;
and

a second device controlled to form a second calibration pattern on the calibration wafer in the first orientation, and to process the production wafer in a second orientation different from the first orientation and aligned based on differences between the first calibration pattern and the second calibration pattern.

56. (previously presented) A wafer processing system as recited in claim 55, further comprising a processor arranged to determine the differences between the first

calibration pattern and the second calibration pattern.

57. (previously presented) A wafer processing system as recited in claim 56, wherein the processor is arranged to transform a calibration array based on the differences between the first calibration pattern and the second calibration pattern to produce a transformed array.

58. (previously presented) A wafer processing system as recited in claim 57, further comprising an arrangement to align the production wafer in the second device based on the transformed array.

59. (previously presented) A wafer processing system as recited in claim 55, wherein the first device is a stepper and the second device is a scanner.